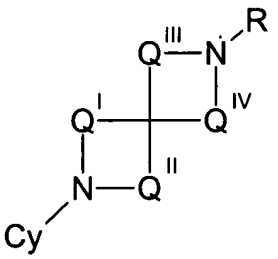
In the Claims

1. (Currently Amended) A diazaspiro nonane compound having the following formula:

Formula 1



and pharmaceutically acceptable salts thereof,

wherein Q^I is $(CZ_2)_u$, Q^{II} is $(CZ_2)_v$, Q^{III} is $(CZ_2)_w$, and Q^{IV} is $(CZ_2)_x$,

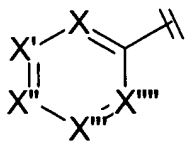
u, v, w and x are individually 0, 1, 2, 3 or 4, preferably 0, 1, 2 or 3,

and the values of u, v, w and x are selected such that the ring is a diazaspiro nonane,

R is hydrogen, lower alkyl, acyl, alkoxycarbonyl or aryloxycarbonyl,

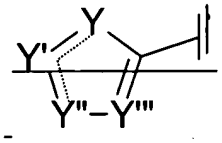
Z is, individually, selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl;

Cy is a six membered ring of the formula:



where ~~each~~ one of X, X', X", X''' and X'''' is ~~individually~~ nitrogen, ~~nitrogen bonded to oxygen or~~ and the others are carbon bonded to a substituent species, ~~wherein no more than three of X, X', X", X''' and X'''' are nitrogen or nitrogen bonded to oxygen,~~

~~or Cy is a five 5-membered heteroaromatic ring of the formula:~~



~~where Y and Y" are individually nitrogen, nitrogen bonded to a substituent species, oxygen, sulfur or carbon bonded to a substituent species, and Y' and Y''' are nitrogen or carbon bonded to a substituent species,~~

wherein "substituent species" are, individually, selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, heterocyclyl, substituted heterocyclyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl, substituted arylalkyl, halo, -OR', -NR'R", $-CF_3$, -CN, $-NO_2$, $-C_2R'$, -SR', $-N_3$, -C(=O)NR'R", -NR'C(=O) R", -C(=O)R', -C(=O)OR', -OC(=O)R', $-O(CR'R")_rC(=O)R'$, $-O(CR'R")_rNR"C(=O)R'$, $-O(CR'R")_rNR"SO_2R'$, -OC(=O)NR'R", -NR'C(=O)O R", $-SO_2R'$, $-SO_2NR'R"$, and $-NR'SO_2R"$,

where R' and R" are individually hydrogen, C_1-C_8 alkyl, cycloalkyl, heterocyclyl, aryl, or arylalkyl, and r is an integer from 1 to 6, or R' and R" can combine to form a cyclic functionality, and

wherein the term "substituted" as applied to alkyl, aryl, cycloalkyl and the like refers to the substituents described above, starting with halo and ending with -NR'SO_2R"~~, and~~

~~wherein the dashed lines indicate that the bonds (between Y and Y' and between Y' and Y") can be either single or double bonds, with the proviso that when the bond between Y and Y' is a single bond, the bond between Y' and Y" must be a double bond and vice versa, where Y or Y" is oxygen or sulfur, only one of Y and Y" is either oxygen or sulfur, and at least one of Y, Y', Y" and Y"' must be oxygen, sulfur, nitrogen or nitrogen bonded to a substituent species~~.

Claims 2-3. (Cancelled)

4. (Currently Amended) The compound of claim 1, wherein X"' is nitrogen ~~or nitrogen bonded to oxygen~~.

Claim 5. (Cancelled)

6. (Original) The compound of claim 1, wherein X, X" and X"" are carbon bonded to a substituent species.

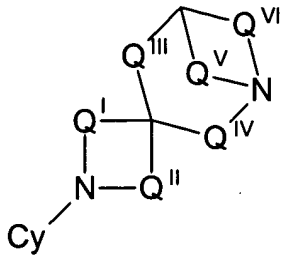
7. (Original) The compound of claim 6, where the substituent species at X, X" and X"" are hydrogen.

Claims 8-10. (Cancelled)

11. (Currently Amended) A pharmaceutical composition including a compound of claim 1 along with a pharmaceutically acceptable carrier.

Claims 12-20. (Cancelled)

21. (Currently Amended) A compound having the following formula:



Formula 2

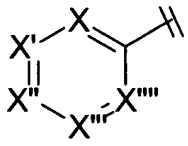
and pharmaceutically acceptable salts thereof,

wherein Q^I is $(CZ_2)_u$, Q^{II} is $(CZ_2)_v$, Q^{III} is $(CZ_2)_w$, Q^{IV} is $(CZ_2)_x$, Q^V is$(CZ_2)_y$ and Q^{VI} is $(CZ_2)_z$ where u, v, w, x, y and z are individually 0, 1, 2, 3 or 4, and the values of u, v, w, x, y and z are selected such that the bridged diazaspirocyclic ring contains ~~8, 9, 10, 11, 12 or 13~~ members,

R is hydrogen, lower alkyl, acyl, alkoxycarbonyl or aryloxycarbonyl,

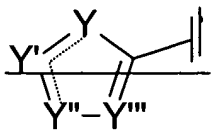
Z is, individually, selected from the group consisting of hydrogen, alkyl, substituted alkyl, cycloalkyl, substituted cycloalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl and substituted arylalkyl;

Cy is a six membered ring of the formula:



where ~~each~~ one of X, X', X", X''' and X'''' is ~~individually~~ nitrogen, ~~nitrogen bonded to oxygen or~~ and the rest are carbon bonded to a substituent species, ~~wherein no more than three of X, X', X", X''' and X'''' are nitrogen or nitrogen bonded to oxygen,~~

~~or Cy is a five 5 membered heteroaromatic ring of the formula:~~



~~where Y and Y" are individually nitrogen, nitrogen bonded to a substituent species, oxygen, sulfur or carbon bonded to a substituent species, and Y' and Y''' are nitrogen or carbon bonded to a substituent species,~~

wherein "substituent species" are, individually, selected from the group consisting of hydrogen, alkyl, substituted alkyl, alkenyl, substituted alkenyl, heterocyclyl, substituted heterocyclyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, alkylaryl, substituted alkylaryl, arylalkyl, substituted arylalkyl, halo, -OR', -NR'R", $-CF_3$, -CN, $-NO_2$, $-C_2R'$, -SR', $-N_3$, -C(=O)NR'R", -NR'C(=O) R", -C(=O)R', -C(=O)OR', -OC(=O)R', $-O(CR'R")_rC(=O)R'$, $-O(CR'R")_rNR"C(=O)R'$, $-O(CR'R")_rNR"SO_2R'$, -OC(=O)NR'R", -NR'C(=O)O R", $-SO_2R'$, $-SO_2NR'R"$, and $-NR'SO_2R"$,

where R' and R" are individually hydrogen, C_1-C_8 alkyl, cycloalkyl, heterocyclyl, aryl, or arylalkyl, and r is an integer from 1 to 6, or R' and R" can combine to form a cyclic functionality, and

wherein the term "substituted" as applied to alkyl, aryl, cycloalkyl and the like refers to the substituents described above, starting with halo and ending with $-NR'SO_2R"$~~, and~~

~~wherein the dashed lines indicate that the bonds (between Y and Y' and between Y' and Y") can be either single or double bonds, with the proviso that when the bond between Y and Y' is a single bond, the bond between Y' and Y" must be a double bond and vice versa, where Y or~~

~~Y" is oxygen or sulfur, only one of Y and Y" is either oxygen or sulfur, and at least one of Y, Y', Y" and Y"' must be oxygen, sulfur, nitrogen or nitrogen bonded to a substituent species.~~

Claims 22-23 (Cancelled)

24. (Currently Amended) The compound of claim 21, wherein X"' is nitrogen ~~or nitrogen bonded to oxygen~~.

Claim 25. (Cancelled)

26. (Original) The compound of claim 21, wherein X, X" and X"" are carbon bonded to a substituent species.

27. (Original) The compound of claim 26, where the substituent species at X, X" and X"" are hydrogen.

Claims 28-30. (Cancelled)

31. (Currently Amended) A pharmaceutical composition including a compound of claim 21 and a pharmaceutically acceptable carrier.

Claims 32-40 (Cancelled).

41. (Original) A compound selected from the group consisting of:

7-(3-pyridyl)-1,7-diazaspiro[4.4]nonane

7-(5-pyrimidinyl)-1,7-diazaspiro[4.4]nonane

7-(5-isoxazolyl)-1,7-diazaspiro[4.4]nonane

7-(5-isothiazolyl)-1,7-diazaspiro[4.4]nonane

7-(5-(1,2,4-oxadiazol)yl)-1,7-diazaspiro[4.4]nonane

7-(2-(1,3,4-oxadiazol)yl)-1,7-diazaspiro[4.4]nonane

7-(2-pyrazinyl)-1,7-diazaspiro[4.4]nonane

7-(3-pyridazinyl)-1,7-diazaspiro[4.4]nonane

7-(5-methoxy-3-pyridyl)-1,7-diazaspiro[4.4]nonane

7-(5-cyclopentyloxy-3-pyridyl)-1,7-diazaspiro[4.4]nonane

7-(5-phenoxy-3-pyridyl)-1,7-diazaspiro[4.4]nonane

7-(5-(4-hydroxyphenoxy)-3-pyridyl)-1,7-diazaspiro[4.4]nonane

7-(5-ethynyl-3-pyridyl)-1,7-diazaspiro[4.4]nonane

7-(6-chloro-3-pyridyl)-1,7-diazaspiro[4.4]nonane

7-(6-methoxy-3-pyridazinyl)-1,7-diazaspiro[4.4]nonane

1-(3-pyridyl)-1,7-diazaspiro[4.4]nonane

1-(5-pyrimidinyl)-1,7-diazaspiro[4.4]nonane

1-(5-isoxazolyl)-1,7-diazaspiro[4.4]nonane

1-(5-isothiazolyl)-1,7-diazaspiro[4.4]nonane

1-(5-(1,2,4-oxadiazol)yl)-1,7-diazaspiro[4.4]nonane

1-(2-(1,3,4-oxadiazol)yl)-1,7-diazaspiro[4.4]nonane

1-(2-pyrazinyl)-1,7-diazaspiro[4.4]nonane

1-(3-pyridazinyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(3-pyridyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(5-pyrimidinyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(5-isoxazolyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(5-isothiazolyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(5-(1,2,4-oxadiazol)yl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(2-(1,3,4-oxadiazol)yl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(2-pyrazinyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(3-pyridazinyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(5-methoxy-3-pyridyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(5-cyclopentyloxy-3-pyridyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(5-phenoxy-3-pyridyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(5-(4-hydroxyphenoxy)-3-pyridyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(5-ethynyl-3-pyridyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(6-chloro-3-pyridyl)-1,7-diazaspiro[4.4]nonane

1-methyl-7-(6-methoxy-3-pyridazinyl)-1,7-diazaspiro[4.4]nonane

7-methyl-1-(3-pyridyl)-1,7-diazaspiro[4.4]nonane

7-methyl-1-(5-pyrimidinyl)-1,7-diazaspiro[4.4]nonane

7-methyl-1-(5-isoxazolyl)-1,7-diazaspiro[4.4]nonane

7-methyl-1-(5-isothiazolyl)-1,7-diazaspiro[4.4]nonane

7-methyl-1-(5-(1,2,4-oxadiazol)yl)-1,7-diazaspiro[4.4]nonane

7-methyl-1-(2-(1,3,4-oxadiazol)yl)-1,7-diazaspiro[4.4]nonane

7-methyl-1-(2-pyrazinyl)-1,7-diazaspiro[4.4]nonane

7-methyl-1-(3-pyridazinyl)-1,7-diazaspiro[4.4]nonane

2-(3-pyridyl)-2,7-diazaspiro[4.4]nonane

2-(5-pyrimidinyl)-2,7-diazaspiro[4.4]nonane

2-(5-isoxazolyl)-2,7-diazaspiro[4.4]nonane

2-(5-isothiazolyl)-2,7-diazaspiro[4.4]nonane

2-(5-(1,2,4-oxadiazol)yl)-2,7-diazaspiro[4.4]nonane

2-(2-(1,3,4-oxadiazol)yl)-2,7-diazaspiro[4.4]nonane

2-(2-pyrazinyl)-2,7-diazaspiro[4.4]nonane

2-(3-pyridazinyl)-2,7-diazaspiro[4.4]nonane

2-(5-methoxy-3-pyridyl)-2,7-diazaspiro[4.4]nonane

2-(5-cyclopentyloxy-3-pyridyl)-2,7-diazaspiro[4.4]nonane

2-(5-phenoxy-3-pyridyl)-2,7-diazaspiro[4.4]nonane

2-(5-(4-hydroxyphenoxy)-3-pyridyl)-2,7-diazaspiro[4.4]nonane

2-(5-ethynyl-3-pyridyl)-2,7-diazaspiro[4.4]nonane

2-(6-chloro-3-pyridyl)-2,7-diazaspiro[4.4]nonane

2-(6-methoxy-3-pyridazinyl)-2,7-diazaspiro[4.4]nonane

2-methyl-7-(3-pyridyl)-2,7-diazaspiro[4.4]nonane

2-methyl-7-(5-methoxy-3-pyridyl)-2,7-diazaspiro[4.4]nonane

2-methyl-7-(5-phenoxy-3-pyridyl)-2,7-diazaspiro[4.4]nonane

~~6-(3-pyridyl)-1,6-diazaspiro[3.4]octane~~

~~1-methyl-6-(3-pyridyl)-1,6-diazaspiro[3.4]octane~~

~~2-(3-pyridyl)-2,5-diazaspiro[3.4]octane~~

~~5-methyl-2-(3-pyridyl)-2,5-diazaspiro[3.4]octane~~

6-(3-pyridyl)-1,6-diazaspiro[3.5]nonane

1-methyl-6-(3-pyridyl)-1,6-diazaspiro[3.5]nonane

2-(3-pyridyl)-2,5-diazaspiro[3.5]nonane

5-methyl-2-(3-pyridyl)-2,5-diazaspiro[3.5]nonane

~~2-(3-pyridyl)-2,6-diazaspiro[4.5]decane~~

~~6-methyl-2-(3-pyridyl)-2,6-diazaspiro[4.5]decane~~

~~7-(3-pyridyl)-1,7-diazaspiro[4.5]decane~~

~~1-methyl-7-(3-pyridyl)-1,7-diazaspiro[4.5]decane~~

~~8-(3-pyridyl)-1,8-diazaspiro[5.5]undecane~~

~~1-methyl-8-(3-pyridyl)-1,8-diazaspiro[5.5]undecane~~ and

pharmaceutically acceptable salts thereof.

Claim 42. (Cancelled)

43. (Currently Amended) A pharmaceutical composition comprising an effective amount of a compound of claim 41 along with a pharmaceutically acceptable carrier.

Claim 44. (Cancelled)

Restriction Requirement

The claims were restricted into eight groups.

Group I, Claims 1-11, 21-31, and 41-44 in part, is directed to compounds and pharmaceutical compositions where the core is a diazaspiro nonane and the Cy group is pyridinyl.

Group II, claims 1-11, 21-31, and 41-44 in part, is directed to compounds and pharmaceutical compositions where the core is a diazaspiro decane and the Cy group is pyridinyl.

Group III, Claims 1-11, 21-31, and 41-44 in part, is directed to compounds and pharmaceutical compositions where the core is a diazaspiro octane and the Cy group is pyridinyl.

Group IV, Claims 1-11, 21-31, and 41-44 in part, is directed to compounds and pharmaceutical compositions where the core is a diazaspiro undecane and the Cy group is pyridinyl.

Group V, Claims 1-11, 21-31, and 41-44 in part, is directed to compounds and pharmaceutical compositions where the core is a spiro (1-azabicyclo[2.2.1]heptane)-2,3'-pyrrolidine.

Group VI, Claims 1-11, 21-31, and 41-44 in part, is directed to compounds and pharmaceutical compositions where the core is a spiro (1-azabicyclo[2.2.1]octane)-2,3'-pyrrolidine.

Group VII, Claims 1-11, 21-31, and 41-44 in part, is directed to compounds and pharmaceutical compositions where the core is other than those described in Groups I-VI.

Group VIII, claims 12-20 and 32-40, is directed to methods of treatment.

Applicants hereby elect Group I for further prosecution on the merits. Applicants have amended Claim 1 to specify that the ring is a diazaspiro nonane, and amended Claim 21 to specify that the diazaspiro ring includes 9 members. Applicants have amended claim 41 to delete reference to ring systems that are not diazaspiro nonanes. As Group I included Claims 21-31, it is believed that the amendment to Claim 21 is within the spirit of the Restriction Requirement.

Applicants have amended independent Claims 1 and 21 to delete reference to Cy groups other than pyridine by specifying that one of the variables (X, X', X", X'" and X"") in the six membered ring is nitrogen and the other variables are carbon, and also amended or cancelled claims dependent on 1 and 21 that defined Cy rings other than pyridine.

It is believed that the claims are currently in condition for Examination on the merits. The Examiner is encouraged to contact Applicants' undersigned representative if she has any questions regarding the above.

Respectfully submitted,

David S. Bradin
Reg. No. 37,783
Attorney for Applicant

Date: August 5, 2004
Docket: T103 1530.1

Womble Carlyle Sandridge & Rice, PLLC
Post Office Box 7037
Atlanta, Georgia 30357-0037
Telephone: (919) 484-2382
Facsimile: (919) 484-2084

CERTIFICATE OF MAILING

I hereby certify that the following documents are being mailed in an envelope by First Class mail to:

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Response to Restriction Requirement
One month extension of time (in duplicate)
Return Postcard

on August 5, 2004.

Donnie S. Dietrich (Typed or printed name of person mailing correspondence)

Donnie S. Dietrich (Signature of person mailing correspondence)

Serial Number: 10/607,930 Filing Date: June 27, 2003
Title: N-Aryldiazaspiroazacyclic Compounds and Methods of Preparation and Use Thereof
Our Reference Number: T103 1530.1